

## BASF adds high heat automotive materials...

**B**ASF has introduced two high temperature materials specifically for automotive use, and improved the flow of its PBTs and PESUs.

The first new high temperature material, Ultramid TOP3000, is a 10 per cent mineral-filled partly aromatic polyamide which is intended for body components able to withstand on-line painting and drying at just above 200 degC. The other is a specially pigmented polyether sulphone that prevents overheating in close proximity to the headlight bulb.

BASF says that Ultramid TOP3000 has achieved Class A quality in various coating lines under different conditions and coating concepts. It can be powder-coated without a primer but is apparently not conductive – and as the technology is the subject of a patent application BASF is saying no more.

The nature of the mineral filler is undisclosed, as is the nature of the nano-particles which form part of the compound's make-up and aid flow.

Ultramid TOP 3000 has been developed to improve on 'the often employed polymer blends based on PPE/PA66' with a lower coefficient of thermal expansion and dimensional stability at elevated service temperatures, but is not a drop-in replacement for Noryl.

The new nylon also has improved hydrolytic stability. BASF says it absorbs and releases water 'considerably more slowly' than other nylons and retain stiffness even when moist.

BASF's use of nano-additives to improve flow – a technology being adopted by most major polymer manufacturers today – is echoed in 15 new High Speed grades of Ultradur PBT, with the whole Ultradur series now having high flow options which at least double flow length. BASF is again keeping the exact nature of the nano-additives secret but says it is a patented in-house development, and that research is under way to apply the same principles across its other engineering materials, notably its nylons. To enable moulders to assess the potential cost savings from switching to high flow PBT grades BASF has put a cost calculator on line at [www.basf.de/ultradur/costcalculator](http://www.basf.de/ultradur/costcalculator).

The new PESU is intended for headlamp housings which are usually coloured black with just a small amount of colorant, which BASF says gives a better surface finish. But the black pigments do not easily allow heat transmission. This is a particular problem above the bulb. The options are to either raise the thermal conductivity with fillers – risking the surface finish – or to reduce the wall thickness, which can lead to filling and stiffness problems. The BASF answer is a new pigment system which absorbs visible light – so it looks black – but allows heat radiation to pass through. BASF says test results show that in a situation where a conventionally-pigmented PESU is heated with a halogen light bulb and reaches 190 degC, under the same conditions a PESU with the new HM (heat management)

pigment only reaches 130 - 150 degC.

The HM grade of Ultrason has been introduced alongside an even more radically-modified PESU. This has been formulated to improve flow by blending the PESU with another, unspecified, thermoplastic rather than lowering the molecular weight which can improve processing but at the expense of impact strength and stress crack performance. Flow is improved 10 - 20 per cent compared with pure PESU while maintaining temperature resistance and impact strength. BASF is still

### ... and Lanxess expands headlamp options with high heat PBT

**A**GRADE of PBT tuned to withstand today's higher heat demands and aesthetics in car headlamp bezels has been introduced by Lanxess. Pocan DP 1203 is a non-reinforced PBT and extends Lanxess's headlamp material range which includes not only other PBTs, but also Durethan heat-stable nylons.

Trends which are currently influencing developments in headlamp bezels include the higher temperatures from increasing use of light sources such as xenon and the closer proximity of hot light sources because the distance between the sub-assembly and the engine is becoming smaller. Higher temperatures also mean stricter demands on the gas emission behaviour of the thermoplastics from which the bezels are made.

The specifications for aesthetic quality are also increasing because more and more



Ultramid TOP 3000 can be coated on-line with the rest of the metal car body.

fine tuning this HP (high productivity) grade but says initial quantities are available for sampling.

[www.basf.de/kunststoffe](http://www.basf.de/kunststoffe)

headlamps are designed in a clear-glass look and so the components inside have to look immaculate.

Pocan DP 1203 can be metallised without primer pretreatment and can be used at service temperatures well above those of polycarbonate. Lanxess sees it as an alternative to expensive high heat thermoplastics such as copolycarbonate and polyether sulphone, often the fall back choice when polycarbonate does not have adequate heat stability.

In addition, says Lanxess, the additives in the PBT cause virtually no plate-out during processing and the release of gases which, over the long term, can cause fogging of the clear glass headlamp lens.

[www.lanxess.com](http://www.lanxess.com)

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### Conductive Noryl gets environmental endorsement for powder coating

**G**E Plastics' conductive Noryl GTX PPE-PA alloys have been added to General Electric's ecomagination portfolio of environmentally responsible products (although what happens to ecomagination plastics now that GE Plastics is being sold to SABIC has yet to be seen).

They are optimised for powder coating and contain conductive fillers that eliminate the need to apply an electrostatic primer, which can emit harmful solvents and related compounds into the air.

According to GE Plastics conversion to powder-coating can reduce volatile organic

compounds emissions up to 98 per cent and result in overall coating savings of over 49 per cent compared to the typical liquid painting process. Further, they offer the flexibility to replace metal with a lightweight, high-performance plastic, or to run multiple materials on the same coating line. Using conductive Noryl GTX as a substrate can eliminate chemical cleaning and pretreatment of metallic parts, which can result in reduced costs and VOC emissions. For example, a powder coating operation processing 2.5 million square feet per month, switching to conductive Noryl GTX

could eliminate \$105,000 in pretreatment costs and over three tons of VOCs emitted into the air per year, says the company.

Unlike other plastics that must be coated with an electrostatic primer, or metals that must be chemically pretreated to remove grease, GE says conductive Noryl GTX requires only a washing step prior to powder-coating.

Certification of Noryl GTX resins as GE ecomagination products followed an analysis of their environmental and operating benefits and is audited by an independent third party.

[www.geplastics.com](http://www.geplastics.com)

## One-pellet solutions for long-glass fibre compounds

**T**HE new LNP Verton Xtreme compound portfolio from GE Plastics provides one-pellet long-glass fibre solutions for enhanced colour, flame retardancy, and weatherability. The patent-pending technology improves batch-to-batch and part-to-part consistency by eliminating the need to blend two pellet types, which can lead to separation, settling and other quality issues.

LNP Verton Xtreme compound grades – XC for extreme colour, FR for extreme flame retardance, and XW for extreme weatherability – enable customers to achieve the mechanical properties of long-glass fibre reinforcement while boosting quality and consistency that can reduce overall system costs.

GE Plastics plans to manufacture the new materials in the Pacific and Latin American region, as well as in Columbus, Indiana, in the USA where they are currently produced.

Steelcase is one of the first to use the new product line. The company is evaluating injection-moulded Verton XC compound to produce the seat back frame of its award-winning Leap office chair. By replacing a two-pellet solution with Verton Xtreme compound, Steelcase has seen an improvement in surface finish and colour consistency. It expects to improve overall aesthetics while reducing system costs.

Verton XC compound is currently available in a nylon base, while Verton FR compound is available in PC/ABS. The third grade, Verton XW compound, is based on GE's Gelyo material, an amorphous terpolymer of acrylic-styrene-acrylonitrile. It will be available in the third quarter of this year. This product majors on resistance to UV light and weathering, and has



Steelcase Leap office chair uses GE's LNP Verton Xtreme compound for the seat back frame.

potential for truck and agricultural equipment components. All three new Verton Xtreme compounds combine rigidity with strength and resistance to impact failure in a wide array of applications.

These compounds can be processed using standard and gas-assist injection moulding, structural foam moulding, and injection-compression moulding, and can be extruded into profiles.

Future plans for the product line include one-pellet solutions that offer enhanced lubrication for parts such as gears and washers, and enhanced conductivity for powder-coated parts.

[www.geplastics.com](http://www.geplastics.com)

## DuPont Kalrez 9100 improves wafer yields

**K**ALREZ 9100 perfluoroelastomer from DuPont Performance Elastomers has been specially developed for ultra-low contamination in aggressive plasma environments. Kalrez 9100 parts demonstrate 'unusually long life' in the harshest semiconductor manufacturing processes to help cut costly downtime and reduce cost of ownership, says DuPont.

For static and dynamic sealing applications in deposition as well as select etch and ash processes, Kalrez 9100 parts offer performance that surpasses industry maintenance standards for greater equipment up-time. A combination of properties effectively extends seal life, produces higher quality chips and greater yields.

DuPont says that Kalrez 9100 parts offer low erosion and ultra-low particle generation, with very low outgassing and metals content. They resist dry process chemistry including oxygen and fluorine-based plasmas, and have a high thermal stability with a maximum continuous service temperature of 300 degC.

Parts made from Kalrez 9100 have been tested in a variety of semi-conductor process applications where oxygen and fluorinated plasmas are used during the cleaning cycle. In a number of customer evaluations, they exhibited less erosion, lower particle generation and longer seal life compared to competitive perfluoroelastomer parts in both static and dynamic sealing applications.

Kalrez 9100 parts extended PM cycle time from two to three times in HDPCVD, PECVD, etching and ashing applications. Formulations are completely polymeric, so particle generation is ultra low. This increases up-time, cuts maintenance costs, and results in significantly higher wafer yields, says DuPont.

[www.dupontelastomers.com](http://www.dupontelastomers.com)

## biopolymers

### Injection mouldable PHA to replace PS and PP

**T**HREE new grades of Mirel polyhydroxyalkanoate (PHA) have been introduced by Telles, the joint venture between Metabolix and Archer Daniels Midland in the USA. Mirel P1001 and P1002 are for injection moulding and Mirel P2001 is for paper coating.

Mirel P1001 has been formulated to replace styrenics such as polystyrene and Mirel P1002 replaces polyolefins such as polypropylene. The company says they can be processed easily on conventional injection moulding equipment.

Mirel P2001 was developed as an alternative to petroleum-based paper coatings to enable the production of fully biodegradable paper coated cups and food packaging.

[www.telles-mirel.com](http://www.telles-mirel.com)

### Bio-based foamed packaging sheet from BASF

**B**ASF has introduced a packaging material which should enhance its presence in biodegradable plastics. In 2005 it introduced the Ecovio blend of its Ecoflex copolyester with NatureWorks' polylactic acid. Ecoflex, while derived from petrochemicals, is biodegradable and BASF has blended it with other starch-based products to make mulching and packaging film, such as in BIOP Biopolymer Technologies' Biopar.

Now BASF has pushed its bio credentials further by upping the PLA content in a new 'burger box' product containing more than 75 per cent PLA. Ecovio L Foam is aimed at the XPS (extruded polystyrene foam) market and can be processed on standard XPS equipment without

modification to make sheet for thermoforming into packaging. BASF says that according to the ASTM standard D6866 the 'bio-based content' of Ecovio L Foam – the amount of bio-based carbon atoms in the compound – is better than 75 per cent.

Ecovio is currently only at laboratory sampling level and should be available in production scale amounts by early 2008.

### HDPE from 100 per cent renewable sources

**A**HIGH density polyethylene made entirely from sugar-cane-derived ethanol has been developed by Braskem in Brazil. The material has been certified by international laboratory Beta Analytic as containing 100 per cent renewable raw materials and is soon to go into customer trials. Start up of industrial scale production is expected in 2009, with the potential to reach

200,000 tonnes a year.

The material is the result of a research and development project that has already cost some \$5 million. Part of the investment was to build a pilot unit for the production of ethane from renewable feedstock at the Braskem Technology and Innovation Center. This is now producing sufficient quantities for commercial development of the product.